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Methods: A total of 90 patients, who had undergone TAVI, were retrospectively studied. Vascular complications were defined as major and minor according to the Valve Academic Research Consortium (VARC) criteria. Patients were divided into High Cannulation Site (CS) group and Low CS group depending on the common femoral artery puncture site position, in regards to the most inferior border of the inferior epigastric artery.
Results: Vascular complications were significantly more frequent in the high CS group versus the low CS group (32.3% vs 11.9%, p=0.039). High cannulation remained an independent predictor of vascular complications after adjustment for known risk factors (OR: 4.827, CI: 1.441-16.168; p=0.011).
Conclusions: In patients undergoing transfemoral TAVI, arterial puncture above the most inferior border of the inferior epigastric artery is associated with vascular complications.

TCT-839

Early Changes Of Left Ventricle Deformation Indices After Transcatheter Aortic Valve Implantation. A Speckle Tracking Echocardiographic Study

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Background: Transcatheter aortic valve implantation (TAVI) has been established as a reliable alternative treatment in high risk patients, resulting in symptoms and left ventricle function improvement. The aim of this study was to evaluate the impact of TAVI on early recovery of left ventricle function using echocardiographic left ventricular deformation parameters and to define their possible correlation with myocardial function.
Methods: 16 patients (6 females, 81 ± 5 years; EuroScore: 24 ± 4%) with severe aortic stenosis but free of significant coronary artery disease, who underwent TAVI with the CoreValve aortic prosthesis were studied. Conventional 2D and 2D-speckle echocardiography analysis were performed pre-interventional and at discharge. Deformation indices of left ventricle, such as Peak Systolic Longitudinal Strain (PSLS) and Torsion (apex-basal rotation) were determined by speckle tracking echocardiography using commercially available computer software. Besides, Left Ventricle Ejection Fraction (LVEF), calculated with Simpson method, was evaluated at one month follow-up.
Results: In all patients at discharge, a reduction of transaortic peak pressure gradient (p<0.0005), of mean pressure gradient (p<0.0001) was observed, with a concomitant increase in aortic valve area (p<0.0001). In addition, 2D speckle analysis showed a significant improvement of PSLS at discharge (−10.6±2.8 vs −12.8±3.9%, p=0.008). Similarly, left ventricle Torsion was significantly increased comparing to pre-implantation values (7.2±5.1 vs 11.5±6, p=0.015). However, overall LVEF did not change (51.4±8.8 vs 50.9±8.1%; p=0.55). During follow-up, a strong correlation was found between discharge PSLS and one month LVEF, with greater longitudinal deformation (PSLS) associated with higher LVEF (p=0.03). However, one month LVEF compared to discharge, indicated a trend for improvement (p>0.05), but not statistically significant.
Conclusions: Deformation indices of PSLS and Torsion are able to detect early improvement of left ventricle function after TAVI regardless LVEF alteration. Moreover, PSLS seems to predict LVEF in one month. Larger studies with long term follow-up are required.

TCT-840

Mortality Risk For Transcatheter Aortic Valve Implementation Patients Eventually Approaches General Population: Innovative Time Series Analysis Of Outcomes

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Background: TAVI has increasingly improved outcomes for high-risk patients with severe aortic stenosis. We hypothesize that residual mortality risk eventually approaches that of general population.
Methods: 160 patients with severe aortic stenosis who underwent TAVI between January 2007 and October 2011 were assessed.
Results: Procedural success rate was 97%. Cumulative survival (& mortality) rates at 1 and 6 months, 1, 2 and 3 years were 91% (9%), 83%(17%), 72% (28%), 65% (35%), and 57% (43%) respectively. However, specific mortality (survival) at the 3rd year for patient group who were alive after 2 yrs post-procedure (30 patients, age range 70-93 yrs; average 82yrs) was 13% (87%), representing the highest whole-year-equivalent-rate of all periods post-procedure. The comparative UK general population annual death risk ranges from 2% at 70yrs to >17% at 85+ yrs. Factors with significant impact on mortality were: At 6 months: COAD (P < 0.03), extracardiac arteripathy (p <0.05), poor LV function (p< 0.001), previous MI (p<0.017), poor LVEF (p<0.00117) and high creatinine levels (p<0.005); At 1 year: renal disease (p <0.0001), MI history (p <0.03); At 2 yrs: poor LVEF (p< 0.04), and high creatinine levels (<0.009); and at 3 yrs: only high creatinine levels (p<0.012) with no significance for cardiac factors. Logistic Euroscore had no significant impact at any point. Most deaths occurred before 1 yr, largely by 6 months post procedure (28 deaths- 64%); only 4 new deaths occurred in the third year.
Conclusions: We presented comparative data at 5 different time points, with outcomes similar or better than other TAVI studies which usually present time-point outcomes separately. Survival for those passing 2 yrs alive is the highest with lowest number of significant mortality linked factors suggesting 'normalisation' towards random (non-cardiac) factors in comparative general population. Further analyses is required with larger number of patients for longer time points and this could lead to new paradigm in selection criteria for TAVI patients.

TCT-841

One Year Outcomes following Transcatheter Aortic Valve Implantation Versus Surgical Aortic Valve Replacement In Patients Over 75 Years 'The Elderly Pilot Study'

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Background: Elderly patients with severe aortic stenosis (AS) are high risk for surgical aortic valve replacement (SAVR). Transcatheter aortic valve implantation (TAVI) has emerged as an alternative. The study aim was to compare clinical outcomes of TAVI vs. SAVR in elderly patients with severe AS.
Methods: All consecutive patients with severe AS ≥75 years old treated in our center with either TAVI (n=226) or SAVR (n=222) were analyzed. A propensity score analysis was performed to adjust for differences in baseline clinical characteristics between the two groups.
Results: Patients treated with TAVI were significantly older (82.4±4.3 vs. 79.0±2.9 years; p<0.001) with more co-morbidities, higher Logistic EuroSCORE (25.1±16.6% vs. 13.1±11.7%; p<0.001) and STS score (8.6±7.5 vs. 5.8±7.3; p<0.001). At one-year, at the adjusted analysis, there was an advantage favoring TAVI in the primary study objective of VARC combined efficacy endpoint (adjusted odds ratio [OR] 0.45; 95% confidence interval [CI] 0.24-0.86; p=0.02). There was no difference in 30-day all-cause mortality at the unadjusted analysis (unadjusted OR 0.98; 95% CI 0.38-2.51; p=0.961), however a benefit of TAVI was observed at the adjusted analysis (adjusted OR 0.27; 95% CI 0.08-0.95; p=0.041). This was no longer apparent at one-year (adjusted OR 0.78; 95% CI 0.40-1.50; p=0.45). Conversely, SAVR had more device success (adjusted OR 0.20; 95% CI 0.06-0.67; p=0.01) and less combined safety endpoint (adjusted OR 1.66; 95% CI 1.02-2.69; p=0.04) at 30-days.
Conclusions: In patients ≥75 years with severe AS, at one-year there was similar efficacy between TAVI and SAVR at unadjusted analysis but an advantage of TAVI at adjusted analysis. These results need to be confirmed in a randomized trial.

TCT-842

Embolic Particles Show Surprising Size Dependent Predilection for Cerebral versus Peripheral Arteries: Results from Computational Fluid Dynamic Modeling

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Background: Embolic particles originating at the aortic valve or ascending aorta can have devastating consequences if they enter the cerebral circulation. Little is known about anatomic embolic origin and cerebral events, as this relationship is difficult to observe. To better understand emboli arising from procedures such as TAVR, we built a computational fluid dynamic (CFD) model of cerebral emboli originating at the aortic valve and ascending aorta.
Methods: An exact computer model of a human aorta and arteries to the brain was derived from CT angiography. Blood flow was modeled by the Navier-Stokes equations using pulsatile inflow at the inlet and physiologic Windkessel models at the outlets. Embolic particulate was injected at the level of the aortic valve and tracked using modified Maxey-Riley equations.
Results: Aortic emboli that entered the cerebral circulation through the carotid or vertebral arteries were localized to specific locations of the proximal aorta, most closely in the region of the right and non-coronary aortic valve cusps. The percent of released particles embolic to the brain was markedly dependent on particle size. Particles 1.0 mm diameter had a 28% chance of reaching the brain, whereas particles 2.5 mm dia or greater had 5% chance of reaching the brain.
Conclusions: Embolic particles reaching the brain appear have specific anatomic locations of origin, and may exhibit a strong size-destination relationship, with larger particulate (greater than 2.5 mm dia) less likely to traverse the cerebral vessel by a factor of 5 or greater. Particles less than 2 mm dia and originating from the right and noncoronary cusps appear more likely to cause cerebral injury according to this model. These data are consistent with sparse literature based on transesophageal echo observations. This CFD modeling method may prove useful for limiting aortic emboli to the brain during cardiovascular procedures.

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